

ONTARIO MINISTRY OF ENVIRONMENT



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OPERATING SUMMARY

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MINISTRY OF THE ENVIRONMENT

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DEPUTY MINISTER

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ASSISTANT DEPUTY MINISTER

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EXECUTIVE DIRECTOR

K.H. Sharpe

PROJECT OPERATIONS BRANCH

DIRECTOR

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ASSISTANT DIRECTOR

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ACTING REGIONAL SUPERVISOR

B.W. Hansler

OPERATIONS ENGINEER

J. Nurmberg

135 St. Clair Avenue West
Toronto 195

CAYUGA
WATER POLLUTION CONTROL PLANT

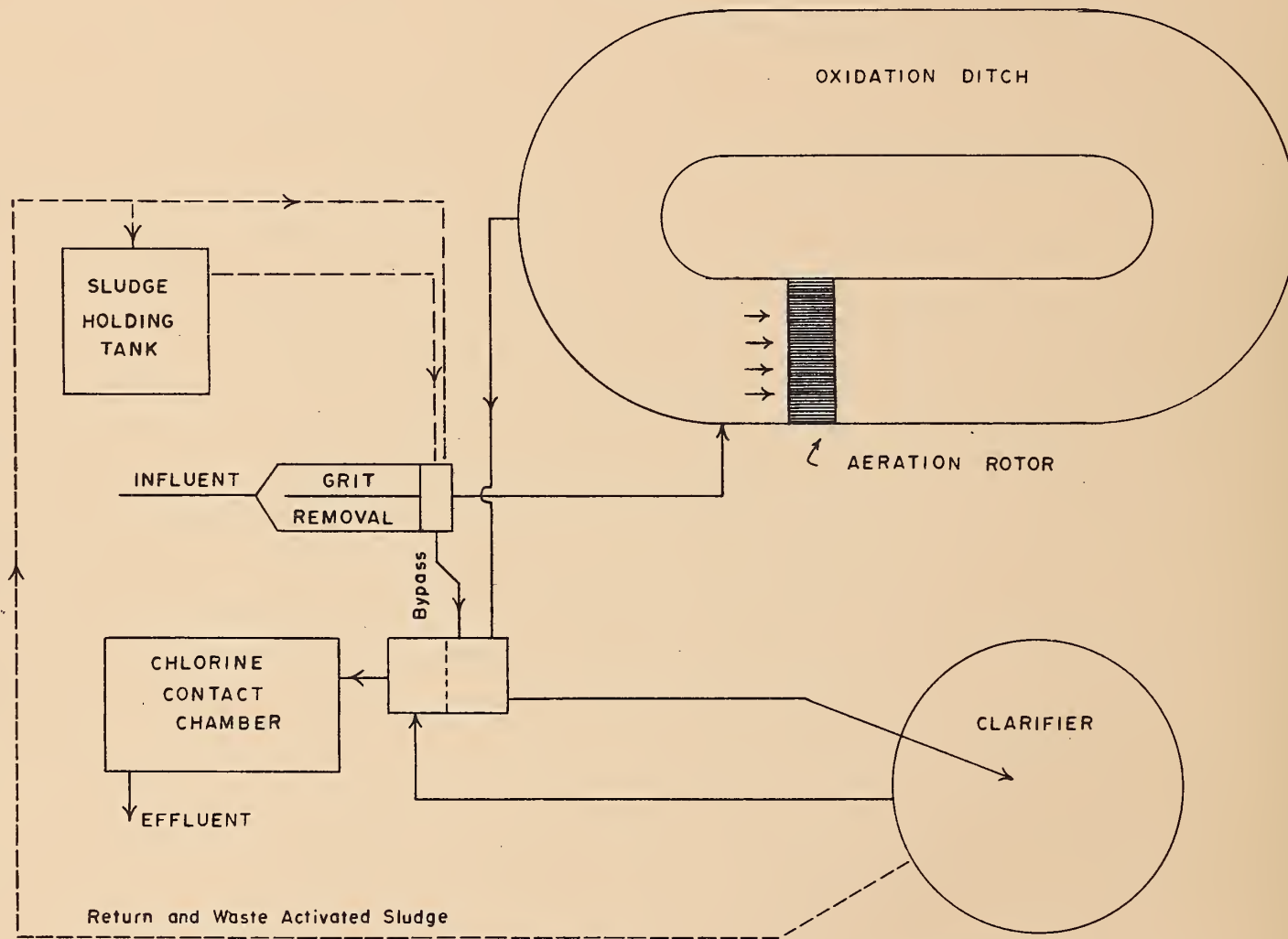
MINISTRY OF THE ENVIRONMENT

1972 ANNUAL OPERATING SUMMARY

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CAYUGA WPCP
FLOW CHART



DESIGN DATA

DESIGN FLOW

200,000 gpd

GRIT REMOVAL

Type: Manually cleaned channels

Size: Two 18'6" x 1'6" x 2'6" deep

AERATION TANK

Type: Oxidation ditch with one Pumps
& Softeners Ltd. rotor

Size: 23,400 cu. ft. or 146,000 gal.

Detention: 65 hr

Flow Velocity: 1 fps (min)

FINAL CLARIFIER

Type: Dorr-Oliver

Size: One 24' dia x 12' swd
(33,800 gal) overflow rate
at design capacity 440 gal/
ft²/day

CHLORINATION

Type: Gas

Size: 50 lb/day

CONTACT TANK

Size: 4750 gal

Detention: 34 min.

'72 Review

GENERAL

The Cayuga water pollution control plant is a 0.20 mgd oxidation ditch, utilizing the extended aeration process. The sewage treatment plant consists of screening facilities grit channel, oxidation ditch, final settling, chlorination, and sludge holding facilities. There is a remote pumping station and sewer system associated with this project. The plant and sewer system are operated by a part-time operator for the Village of Cayuga.

During 1971, there were two building lots serviced. There were no major operating problems associated with this project.

Under the supervision of head office personnel, the staff operated a clean, attractive and very efficient plant for the Village of Cayuga.

EXPENDITURES

The total operating cost of the year was \$10,422.60 or \$340.31 per million gallons of sewage treated. The unit cost of treating one pound of BOD was 25 cents.

PLANT FLOWS AND CHLORINATION

The total raw sewage flow treated for 1972 was 30.92 million gallons. This represented an average daily flow of 0.084 million gallons or 42.0 percent of the plant design capacity of 0.20 mgd.

An average chlorine dosage of 9.7 mg/l was required to maintain an average chlorine residual in the final effluent of 0.5 mg/l.

AERATION

The average MLSS concentration of 12, 150 mg/l and F/M ratio of 0.01 are within the acceptable limits for the extended aeration process.

PLANT EFFICIENCY

The average BOD and suspended solids concentration in the effluent were 135 and 123 mg/l respectively. The effluent BOD and suspended solids concentration of 4 and 9 mg/l were below the Ministry of the Environment's objective of 15 mg/l for each. Removal efficiencies for BOD and suspended solids were 97 and 93 percent respectively.

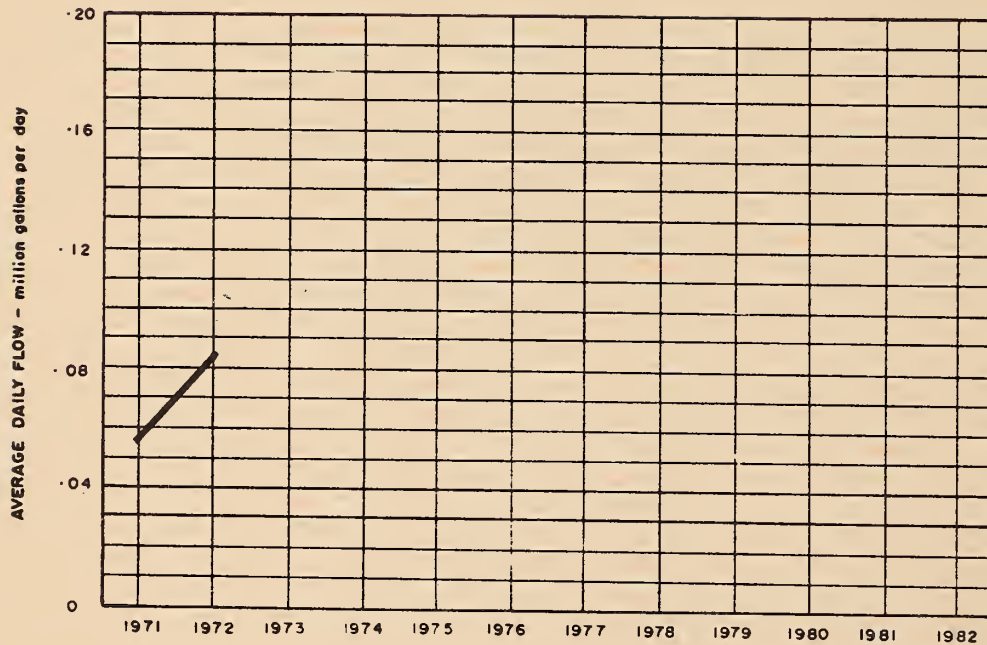
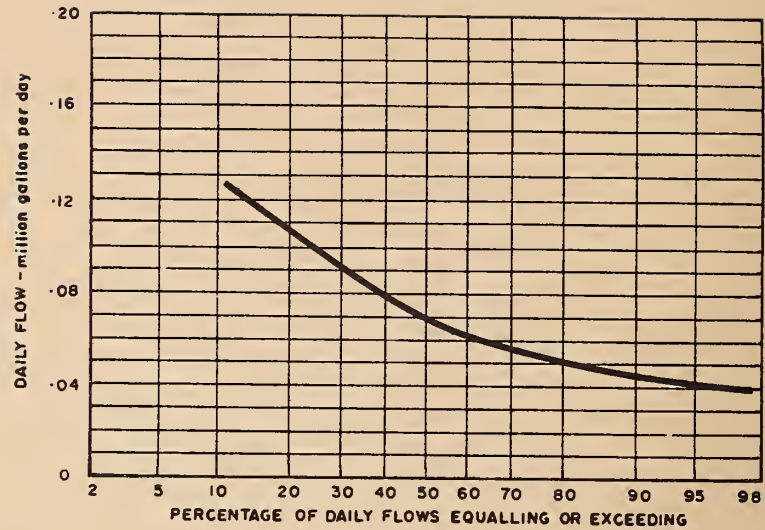
CONCLUSIONS

The plant produced an excellent effluent throughout the year.

Low influent BOD and suspended solids concentrations indicate that an excessive volume of storm water is still gaining access to the sewer system.

PROCESS DATA

FLOWS

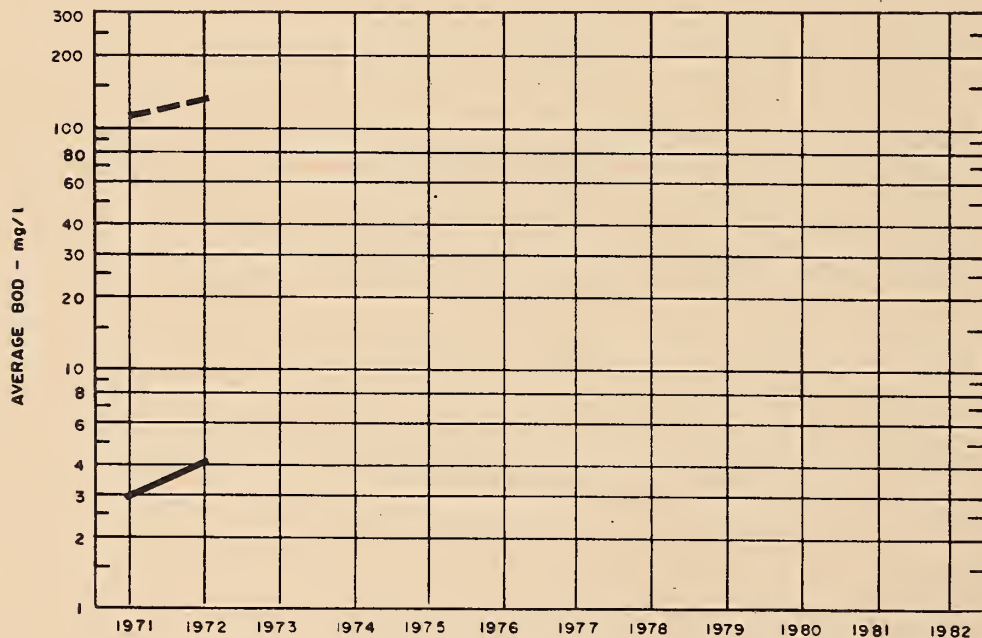
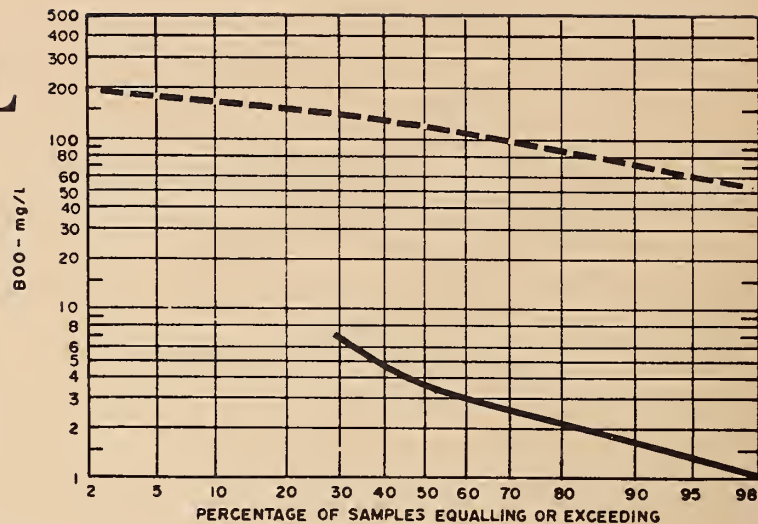


DESIGN CAPACITY 0.20 MGD

PLANT PERFORMANCE

MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW million gallons	AVERAGE DAY mil. gal	MAXIMUM DAY mgd	INFLUENT mg/l	EFFLUENT mg/l	REDUCTION		INFLUENT mg/l	EFFLUENT mg/l	REDUCTION		INFLUENT mg/l P	EFFLUENT mg/l P
						%	10 ³ pounds			%	10 ³ pounds		
JAN	3.30	.106	.202	70	4	94	2.2	75	5	93	2.3	14.0	3.7
FEB	1.96	.067	.086										
MAR	3.86	.124	.349	90	8	91	3.2	50	5	90	1.7	7.5	2.9
APR	4.31	.144	.343	70	7	90	2.7	80	5	94	3.2	8.3	4.6
MAY	2.13	.069	.110	120	2	98	2.5	100	10	90	1.9	12.0	7.0
JUNE	2.05	.066	.149	175	4	98	3.5	210	5	98	4.2	12.8	8.5
JULY	1.66	.054	.096	190	1	99	3.1	110	10	91	1.7	14.0	9.0
AUG	1.54	.050	.071	220	2	99	3.3	185	8	96	2.7	14.0	9.2
SEPT	1.66	.055	.151	180	1	99	3.0	100	5	95	1.6	11.0	5.0
OCT	1.99	.064	.132										
NOV	2.70	.090	.135	68	4	94	1.7	85	15	82	1.9	7.8	3.9
DEC	3.76	.121	.231	110	2	98	4.1	130	20	85	4.1	7.7	2.8
TOTAL	30.92	-	-	-	-	-		-	-	-		-	-
AVG.		.084	MAXIMUM .349	135	4	97	2.9	123	9	93	2.5	11.1	6.0
No. of Samples	-	-	-	13	13	-	-	13	13	-	-	13	13

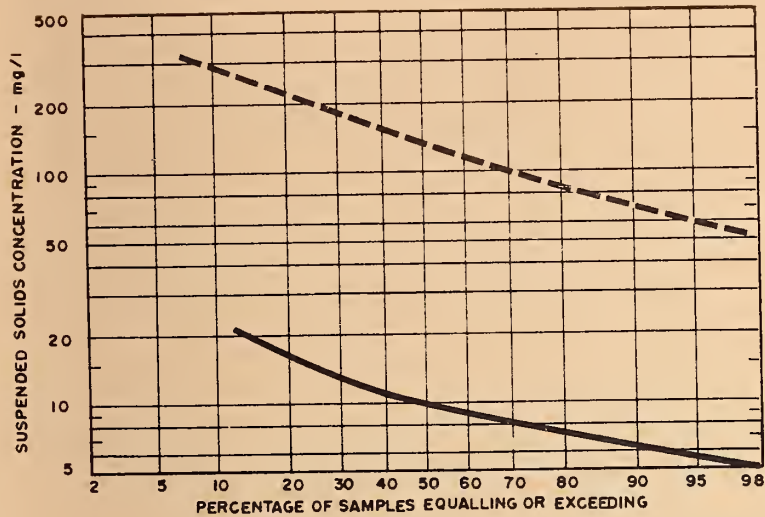
BIOCHEMICAL OXYGEN DEMAND



PLANT INFLUENT - - - - -

PLANT EFFLUENT _____

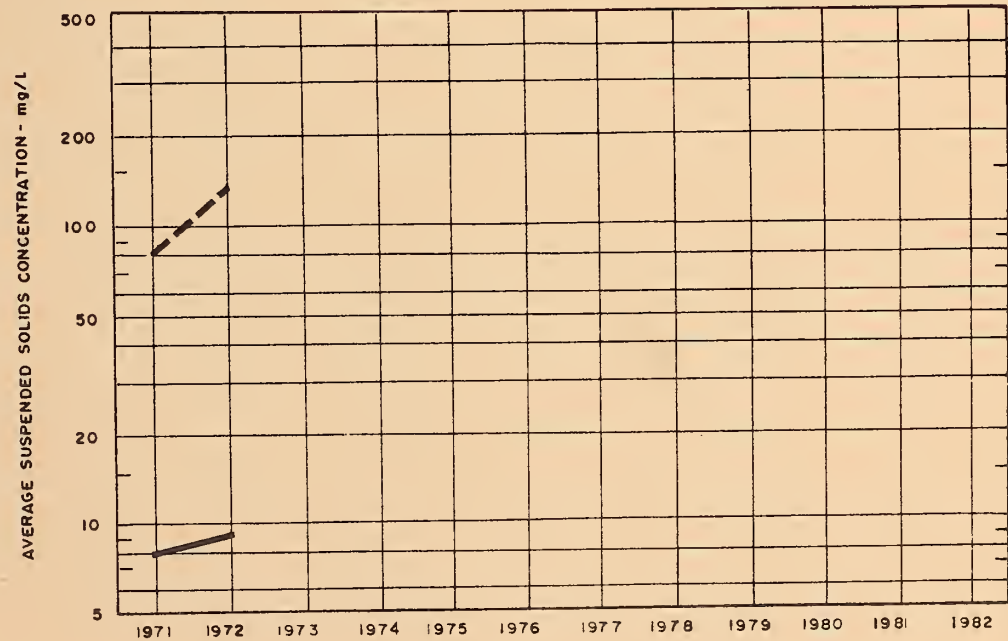
SUSPENDED SOLIDS



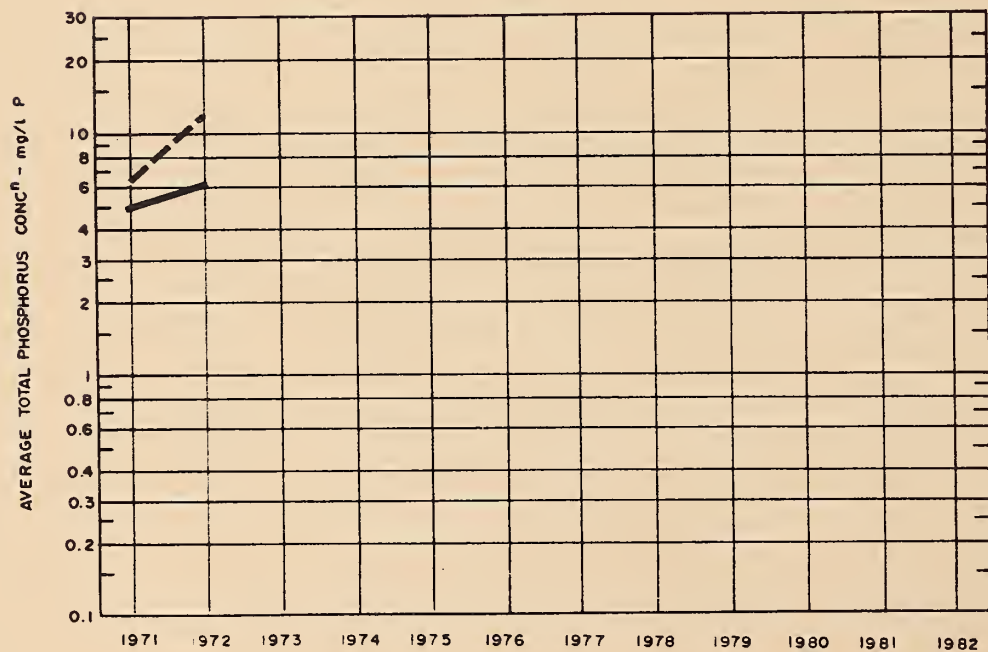
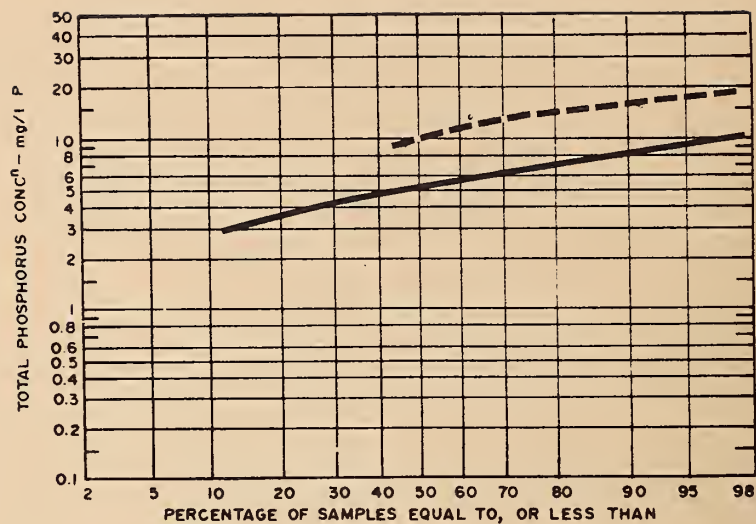
PLANT INFLUENT

PLANT EFFLUENT

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PHOSPHORUS



PLANT INFLUENT

PLANT EFFLUENT

TREATMENT DATA

MONTH	GRIT	CHLORINATION		AERATION			WASTE SLUDGE			AEROBIC DIGESTER			
	QUANTITY REMOVED	Cl ₂ USED	AVG. DOSAGE	MLSS. CONC	F/M	AIR USED	QUANTITY	SUSPENDED SOLIDS	VOL. SOLIDS	QUANTITY	SUSPENDED SOLIDS	VOL. SOLIDS	AMOUNT HAULED
	cubic feet	pounds	mg/l	mg/l	day ⁻¹	$\frac{1000 \text{ ft}^3}{\text{lb BOD}}$	10 gallons	mg/l	%	10 gallons	mg/l	%	cubic yards
JAN	3.1	289	8.8										
FEB	2.9	217	11.1										
MAR	3.8	278	7.2										
APR	3.0	262	6.1										
MAY	3.1	298	14.0										
JUNE	3.0	204	10.0	12150	.01			13660					
JULY	3.1	159	9.5										
AUG	3.1	154	10.0										
SEPT	3.0	171	10.3										
OCT.	5.0	207	10.4										
NOV	4.0	279	10.7										
DEC	5.0	299	8.0										
TOTAL	42.1	2817	-	-	-	-		-	-		-	-	
AVG.	1.4 cu. ft/mil gal	235	9.7	12150	.01			13660					

DATE DUE

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Cayuga Water Pollution Control
Plant.

1972 annual operating summary

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